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# CENTRAL INTELLIGENCE GROUP

## INTELLIGENCE REPORT

COUNTRY USSR

SUBJECT The Stalin Canal

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SUPPLEMENT

50X1-HUM

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I. General

1. The course of the Stalin Canal from Belomorsk to Povenets is 221 km. The length of the part wholly or partially excavated is 48 km; the remaining 173 km. consist of regulated lakes or rivers. The widths of the constructed parts of the canal vary between 50 and 80 meters, and the depths between 8 and 9 meters.

II. Locks

The length of the locks varies but is always at least 112 meters. The width is in all cases 15 meters and the depth  $3\frac{1}{2}$  or 4 meters. The floors of the locks dug out of the soft earth are strongly lined with reinforced concrete. Between the timbered walls of the lock-chambers and the earth, there is a layer of concrete one meter thick which is strongly fastened into the earth by means of iron staples.

3. Most of the lock gates are of wood and are of two main types, low pressure and high pressure. The former are for pressures up to 6.35 meters and are suitable for the upper and lower gates, while the latter are used for pressures up to 9.35 meters and are suitable for center gates. The gates are usually in two sections, with cross-supports of timber 26 x 24 centimeters thick. The mechanism for opening and closing the locks is electrical, and each lock has in addition a directional installation.
4. The waters of Lake Onega are 32.20 meters above sea level, and the canal, on leaving this lake, is governed by the damming of the Povenchanka River, in which there are seven locks. These locks lift vessels up to the level of Lakes Uzkie and Vodla, 102.40 meters above sea level, a rise of 70.20 meters (102.40 minus 32.40).
5. Lock No. 1: This lock, which has been dug out of soft earth, has two chambers. It lifts vessels 10.5 meters to an elevation of 42.70 meters above seal level. An artificial canal lined with timber leads into the lock from Lake Onega. Shore dam No. 43 stands behind the lock on the west and runs up to Lock No. 2. It is 600 meters long and built of stone. Further along Lock No. 1 on the east stands dam No. 41, of stone construction with a rounded crest.

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6. Lock No.2: This lock, which has been carved out of soft earth, also has two chambers. Its distance from lock No.1 is about 1,000 meters. It lifts vessels 10.8 meters to an elevation of 55.5 meters above sea level. The storage trough behind the lock connects with the former bed of the Povenchanka River via control aperture No.130. A stone dam runs along the western side of the canal between Locks 2 and 3. On the east is shore dam No.42 and on the west is shore dam No.43.
7. Lock No.3: The two chambers of this lock have been dug out of very soft earth. It stands about 1,200 meters beyond lock No.2, and lifts vessels 10.8 meters to a point 64.30 meters above sea level. Behind lock No.3 to the east is a short stone shore dam, No.44. A stone incline forms the channel leading to lock No.4. The eastern bank of the canal is marked by a row of piles, at which point there is an underwater dam built of stone. There are repair installations at this lock.
8. Lock No.4: This lock has two chambers which have been carved out of the earth. It stands about 1,000 meters beyond lock No.3 and lifts vessels 10.8 meters to a point 75.1 meters above sea level. The western bank of the channel leading to lock No.5 takes the form of a stone dam, 1,500 meters long. There is a shorter dam on the eastern side, shore dam No.45. Lock No.4 has installations for the carrying out of repairs to vessels below the water-line.
9. Lock No.5: The two chambers of this lock have been dug out of particularly soft earth. It stands about 1,000 meters beyond lock No.4 and lifts vessels 10.95 meters to a point 86.05 meters above sea level. The western bank of the canal above the lock is supported by a stone dam; to the east are shore dams 46 and 47, piercing which are control apertures 114 and 131. These dams are built of earth and have inclines covered with stone and turf.
10. Lock No.6: The two chambers of this lock are hewn out of rock. It is situated about 4,000 meters north of lock No. 5 and lifts vessels 10.60 meters to a point 96.65 meters above sea level. North of this lock, on the east, is the stone shore dam No.48, containing control aperture No.132. To the west of lock No.6 lies shore dam No.49.
11. Lock No.7: This lock's single chamber is hewn out of the solid rock. It is situated about 1,100 meters north of lock No.6. It lifts vessels 5.75 meters to the level of Lakes Uzkie and Vodlo (102.40 meters). Behind the lock to the west stretches shore dam No.20.
12. Beyond lock No.7, the Stalin Canal follows a winding course through Lakes Uzkie and Vodlo. Its course is adequately marked with navigational signs. The water level of these lakes is maintained by means of several dams. Shore dams 50,77, and 79, which are built of earth, bound the lakes to the north.
13. As a further means of maintaining Lakes Uzkie and Vodla at a level of 102.40 meters, the waters of Lake Hiis are kept at a level of 114.20 meters by means of dams 81 and 82. Regulating aperture No.111 is located in dam No.82.
14. Forming part of the Stalin Canal and terminating at lock No.8 is a  $6\frac{1}{2}$  kilometer channel which is mainly hewn out of the rock.

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15. Lock No.8: This lock has two chambers carved out of stony ground. It is situated about 21 kilometers north of lock No.7, on the south shore of Lake Matko. This lock lowers northbound vessels 8.9 meters to a point 93.5 meters above sea level.
16. Beyond Lock No.8 the canal runs through Lake Matko, the level of the northern portion of which is regulated by means of shore dams 51 and 52. These dams are of earth, with a layer of stone on the inner incline and of turf on the outer one. The canal's course through this lake is fairly winding but well-marked.
17. Lock No.9: This lock has a single chamber with a rock foundation. The lock, located on the south shore of Lake Telekinskoe, is approached by means of a channel leading from Lake Matko. It lowers northbound vessels 4.5 meters to a point 89 meters above sea level.
18. Beyond lock No.9 the canal follows a course across Lake Telekinskoe. On the north side of this lake run shore dams 78 and 78b. These dams are of earth; their inclines are lined with stone and turf. From Lake Telekinskoe the canal follows the Telekinka River, which is 40 km long, to Lake Vyg. Lake Vyg has been deepened by means of earthen dams on its northern end: dams 53a, 53b, 53v, 53g, 57, 58 and 61. Dam No.57 is  $4\frac{1}{2}$  km in length, while No.58 is a little shorter. The effect of damming Lake Vyg was to cover the lake's four hundred islands and to inundate several villages along the shore.
19. Lock No.10: This lock has two chambers with rocky foundations. It is situated at the northern end of Lake Vyg and provides a crossing over the rapids which unite Lakes Vyg and Voitskoe. Lock No.10 lowers northbound vessels 13 meters to a point 76 meters above sea level.
20. A stone dam runs about 100 meters from lock No.10 to Lake Vyg. To the east of this dam are dams 21 and 22, while below the lock to the east is macadam dam No.63.
21. Beyond lock No.10 the canal crosses Lake Voitskoe, which is actually a widening of the Nizhni Vyg River. This lake is dammed on the west by shore dam No.65 and on the east by shore dam No.65v. These dams are built of earth and stone, and their inclines are lined with stone on the water side and turf on the other. The water in Lake Voitskoe is maintained at a level of 75 meters.
22. Lock No.11: This lock, which has two chambers, is situated at the northern head of Lake Voitskoe. Northbound vessels are lowered 16 meters to a point 60 meters above sea level. Shore dam No.65a on Lake Voitskoe is extended toward the lock by means of regulating dam No.23. Dam No.65b protects the lock at this point, while a shorter stone dam crosses the river to the east of the lock.
23. Beyond lock No.11 the canal proceeds through a widening of the Nizhni Vyg River known as Lake Shavan, and then through the fully-regulated second portion of the Nizhni Vyg. At the mouth of the River Onta are two shore dams, No.54 and No.55; the former runs along the right bank of the River Onta, while the latter is on the left bank of the River Vyg. These dams, which are quite high, are 500 and 600 meters long respectively. The River Vyg is about one kilometer wide in places; its banks are strengthened by stone dams.

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24. Lock No.12: This lock has a single chamber with a rock foundation. It is situated about 2 $\frac{1}{2}$  km NE of Tunkua station. The level of the water below the lock is 55.2 meters and the extent of the fall is 4.8 meters. A part of the former bed of the River Vyg is dammed by shore dams Nos. 67 and 68a; while dam No.66, which is over 100 meters long, is located on the left of the channel leading to the lock. To the east of the lock are two dams, Nos. 25 and 26, the former of which is built of concrete.
25. Lock No.13: This two-chambered lock, located five kilometers above Lock No.12, is built across the bed of the Vyg River. It lowers northbound vessels 8.95 meters to a point 46.25 meters above sea level. Between this lock and lock No.14 the canal generally follows the course of the Vyg, which has been deepened and straightened. Toward lock No.14 the river has been dammed with the high and long shore dams No.71 and No.72a.
26. Lock No.14: This lock has two chambers with rock foundations. Northbound vessels are lowered 10.75 meters to a point 35.5 meters above sea level. Two regulating dams, Nos. 26 and 27, extend to the west of the lock, while west of the channel leading to the lock a stone dam, No.72b, crosses the Vyg River.
27. Between locks No.14 and No.15 a section of the canal has been cut through the rock. To the west of this section lie the rapids which formerly formed a part of the Vyg River.
28. Lock No.15: This lock has two chambers with rock foundations. Northbound vessels are lowered 9.4 meters to a point 26.1 meters above sea level. The lock has equipment for the carrying out of repairs to ships above the water-line.
29. Beyond lock No.15, the Stalin Canal follows the course of the Vyg River, which has been considerably widened and deepened and lined with long dams. Just before reaching lock No.16 the river is dammed on the east by shore dam No.74 and on the west by shore dam No.29 and regulating dam No.30. Dams No.74 and No.29 are built of earth, while dam No.30 is of macadam.
30. Lock No.16: The two chambers of this lock have rock foundations. It is situated at the point where the Vyg River divides into the Shizhnaya and Soroka Rivers. Northbound vessels are lowered 10.8 meters to a point 15.3 meters above sea level. Dam No.30 acts as the regulating dam for the lock. There is also a long stone directional dam, No.65, below the lock, dividing the waters of the Shizhnaya and the Soroka.
31. From lock No.16 the canal follows the Shizhnaya River, which has been strengthened on its right bank by means of a stone dam. Its water level has been raised to 15.3 meters by means of shore dam No.76, on its left bank.
32. Lock No.17: This lock has one chamber with a rock foundation in the bed of the Shizhnaya River. Northbound vessels are lowered 5.55 meters to a point 9.75 meters above sea level. The macadam regulating dam No.31 stretches to the left, in front of the lock. The earthen dam No.138 forms an extension toward the lock. This lock has equipment for above-water-line repairs to vessels.
33. Shore dam No.32 has been built near lock No.18. With the aid of its extension, regulating dam No.139, it maintains the level of the water at 9.75 meters.

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34. Lock No.18: This lock has one chamber with a rock foundation. It stretches across the bed of the Shizhnaya River. Northbound vessels are lowered 5.6 meters to a point 4.15 meters above sea level.
35. The course of the Stalin Canal below lock No.18 follows the Shizhnaya River; the left bank consists of the original river bank, while on the right the earthen shore dam No.33 provides an artificial bank. The extension of this dam is regulating dam No.140, which runs along the right bank of the canal up to lock No.19.
36. Lock No.19: This lock has one chamber with a rock foundation and is situated at the point where the Shizhnaya River flows into the White Sea, a fall of 5.65 meters. The canal is continued by means of a channel which has been dredged a distance of  $9\frac{1}{2}$  kilometers to Belomorsk harbor.

### III. Traffic Capacity

37. Although the Stalin Canal was designed to have a depth of 3.5 meters, and although the lakes and rivers (which are shallower than the canal) are normally dredged every spring, it is quite probable that at times the canal's traffic is limited to ships drawing 2.25 or 2.50 meters.
38. According to the depth of the canal and the dimensions of the locks, the Stalin Canal should be able to accommodate the following types of vessels:
  - a. All canal boats.
  - b. All minesweepers and motor torpedo boats; also old steam torpedo boats.
  - c. Small patrol boats.
  - d. All submarines.
  - e. Storozhevoi and G-class destroyers and S-class torpedo boats stripped of some armament and carrying a limited load of ammunition.
39. The dimensions of the steamboat Anohin, which plies regularly up and down the canal, are: length, about 45 meters; width, about 10 meters. The larger passenger boats carry some 400 passengers. Cargo is usually shipped in lighters drawn by tugs.
40. Small vessels have made the journey through the Stalin Canal in two or three days. Larger vessels may take as much as from ten to fourteen days, since they are unable to proceed at full speed along the narrow winding parts of the canal.

### IV. Navigational Season

41. The length of time during which the canal may be used depends upon ice conditions. The following figures have been extracted from Russian surveys of 1888 to 1920:

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## Waterways Ice-bound

District	Earliest Date	Mean Date	Latest Date
White Sea Povenets	October 18th October 20th	October 26th October 27th	November 11th November 22nd

## Waterways Open

District	Earliest Date	Mean Date	Latest Date
White Sea Povenets	May 6th April 27th	May 20th May 20th	June 9th June 5th

The longest period during which the canal has been confirmed as navigable was 215 days; the shortest period was 160 days; the mean period is 180 days. The most advantageous water levels prevail in normal years from mid-May to the end of July.

V. Harbors and Jetties

42. Medvezhegorsk: This town has a timber wharf which is used by ships plying Lake Onega. The water reaches a depth of 7.5 meters beneath the wharf, which may thus be used by any vessel navigating the Stalin Canal. A branch canal leads from Medvezhegorsk to Medvezhegorsk Station. A 28 kilometer channel, winding but well-marked, leads from Medvezhegorsk to Povenets.
43. Povenets: This town, situated at the mouth of the Stalin Canal, was once the principal port of Lake Onega, but, because of the comparative shallowness of the water here, it has been superseded by Medvezhegorsk. Povenets has a jetty 100 meters long.
44. Mormaselga: There is a jetty here near lock No.8. A good road runs from the jetty to a branch line of the Murmansk railway,  $\frac{1}{2}$  kilometer away.
45. Telekinsk: There is a small jetty near lock No.9. A second-rate road leads from Telekinsk east to Petrovski and south to Mormaselga.
46. Nadvoitsi: A harbor with several good jetties has been built near lock No.10. A good road leads to the railroad station at Nadvoitsi, four kilometers away. There are several warehouses near the jetties.
47. Shavan: There is a jetty near lock No.11 which is served by a moderately good road leading five kilometers north to the Kotskoma railroad station.
48. Vyg Island: There is a jetty near lock No.16 on the west bank of the Soroka River. A good road leads from here to Belomorsk.

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49. Belomorsk: There are a number of wharves at Belomorsk, including a pier for ocean-going vessels. An artificial island has been built into the canal, which, together with the breakwaters, shelters a harbor area twelve square kilometers in size. About 1,200 meters north of lock No.19, at the mouth of the Stalin Canal, stands a temporary wharf which serves a brick factory and a power station. Two more small jetties stand about one kilometer north of lock No.19.

**VI. Bridges and Ferries**

50. A manually-operated pontoon ferry crosses the Stalin Canal north of lock No.2 at Povenets. This ferry, serving the road between Medveshegorsk and Puutinen, accommodates two cars at a time.
51. A footbridge crosses the canal on the south side of lock No.8.
52. A pontoon bridge crosses the canal south of lock No.9 at Telekinsk. Immediately in front of lock No.9 the canal is spanned by a drawbridge.  
 Comment: It is not clear from the original text whether there are two separate bridges near lock No.9 or only one described differently.) 50X1-HUM
53. North of lock No.10 at Nadvoitsi there are footbridges crossing the canal and the former bed of the Vyg River. Vessels can pass under the canal bridge. These bridges have stone caissons, iron supports, and timber carriage-ways.  
 Comment: bridges on supports of reinforced concrete cross both phases of the rapids immediately below the lock installations. It is not clear whether this refers to the same or different bridges.) 50X1-HUM
54. A swing-bridge crosses the canal and the former bed of the Vyg River at Risti Island, north of lock No.12. It has a carriage-way of timber on stone supports.  
 Comment: a swing-bridge crosses the canal about 150 meters below the lock and that a second bridge crosses the former river bed.) 50X1-HUM
55. A pontoon bridge stretches across the canal immediately above the channel entering lock No.15.  
 Comment: there is a temporary pontoon bridge, both sides of which turn to allow the passage of vessels, at Sosnovits, south of lock No.15.) 50X1-HUM
56. A railway bridge used for the Belomorsk-Oberzerkaya line spans the canal about 750 meters north of lock No.18 at Shizhnaya. This bridge, which was still temporary in 1940, is 60 meters long and opens by swinging on the center pier. Its supports are of iron and the carriage-way is of wood.  
 Comment: a permanent railway bridge is under construction; it will have a concrete foundation and a superstructure of iron and will be high enough to allow the passage of ships. 50X1-HUM

**VII. Condition of the Canal**

57. At the end of 1942, the Stalin Canal was not in good condition. The walls of several lock chambers were broken, canal banks had worn away at some points, and, in spite of dredging each spring, the channel was too shallow for use in many places. In many cases, machinery had fallen into such disrepair that manual labor had to be used to operate the locks. However, an Izvestia article of 2 August 1946 claimed that all damage had been repaired on the eight sluices, nineteen dams, ten sectors, and five floodgates of the Stalin Canal. The canal was reported to have been reopened for general use on 28 July 1946.

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